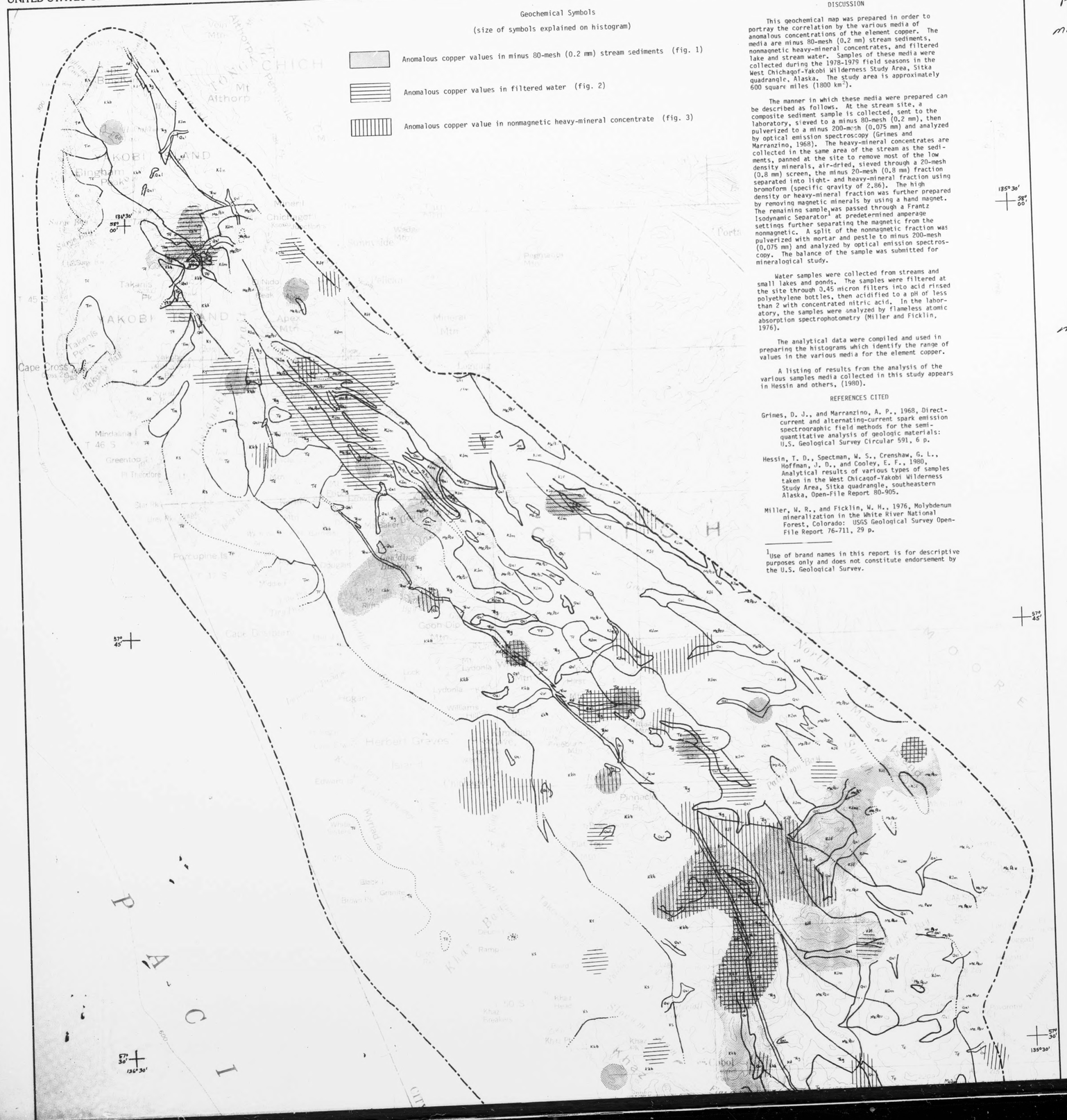
DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY



DISCUSSION

This geochemical map was prepared in order to portray the correlation by the various media of anomalous concentrations of the element copper. The media are minus 80-mesh (0.2 mm) stream sediments, nonmagnetic heavy-mineral concentrates, and filtered lake and stream water. Samples of these media were collected during the 1978-1979 field seasons in the West Chichagof-Yakobi Wilderness Study Area, Sitka quadrangle, Alaska. The study area is approximately 600 square miles (1800 km^2).

The manner in which these media were prepared can be described as follows. At the stream site, a composite sediment sample is collected, sent to the laboratory, sieved to a minus 80-mesh (0.2 mm), then pulverized to a minus 200-mesh (0.075 mm) and analyzed by optical emission spectroscopy (Grimes and Marranzino, 1968). The heavy-mineral concentrates are collected in the same area of the stream as the sediments, panned at the site to remove most of the low density minerals, air-dried, sieved through a 20-mesh (0.8 mm) screen, the minus 20-mesh (0.8 mm) fraction separated into light- and heavy-mineral fraction using bromoform (specific gravity of 2.86). The high density or heavy-mineral fraction was further prepared by removing magnetic minerals by using a hand magnet. The remaining sample was passed through a Frantz Isodynamic Separator[1] at predetermined amperage settings further separating the magnetic from the nonmagnetic. A split of the nonmagnetic fraction was pulverized with mortar and pestle to minus 200-mesh (0.075 mm) and analyzed by optical emission spectroscopy. The balance of the sample was submitted for mineralogical study.

Water samples were collected from streams and small lakes and ponds. The samples were filtered at the site through 0.45 micron filters into acid rinsed polyethylene bottles, then acidified to a pH of less than 2 with concentrated nitric acid. In the laboratory, the samples were analyzed by flameless atomic absorption spectrophotometry (Miller and Ficklin, 1976).

The analytical data were compiled and used in preparing the histograms which identify the range of values in the various media for the element copper.

A listing of results from the analysis of the various samples media collected in this study appears in Hessin and others, (1980).

REFERENCES CITED

Grimes, D. J., and Marranzino, A. P., 1968, Direct-current and alternating-current spark emission spectrographic field methods for the semi-quantitative analysis of geologic materials: U.S. Geological Survey Circular 591, 6 p.

Hessin, T. D., Spectman, W. S., Crenshaw, G. L., Hoffman, J. D., and Cooley, E. F., 1980, Analytical results of various types of samples taken in the West Chicagof-Yakobi Wilderness Study Area, Sitka quadrangle, southeastern Alaska, Open-File Report 80-905.

Miller, W. R., and Ficklin, W. H., 1976, Molybdenum mineralization in the White River National Forest, Colorado: USGS Geological Survey Open-File Report 76-711, 29 p.

[1]Use of brand names in this report is for descriptive purposes only and does not constitute endorsement by the U.S. Geological Survey.

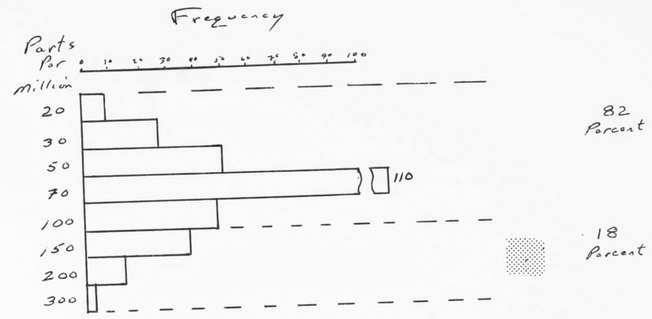


Figure 1.--Histogram showing copper in 296, minus 80-mesh (0.2 mm) stream-sediment samples in the West Chichagof-Yakobi Wilderness Study Area. The dotted symbols indicates anomalous concentrations of copper and class percentages computed on total sample population. Analysis by optical emission spectroscopy (Grimes and Marranzino, 1968).

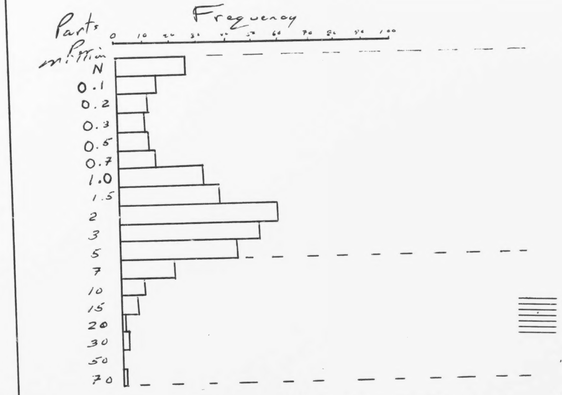


Figure 2.--Histogram showing copper in 341, filtered water samples from the West Chichagof-Yakobi Wilderness Study Area. The horizontal line symbol indicates anomalous concentrations of copper and class percentages computed on total sample population. Analysis by flameless atomic absorption spectrophotometry, Miller and Ficklin, 1976).

N, not detected at limit of detection

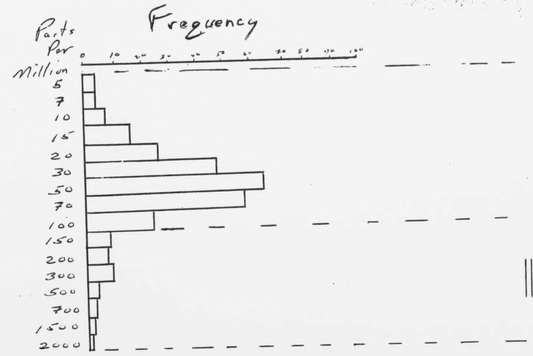


Figure 3.--Histogram showing copper in 287, nonmagnetic, heavy-mineral concentrates from the West Chichagof-Yakobi Wilderness Study Area. The vertical line symbol indicates anomalous concentrations of copper and class percentages computed on total sample population. Analysis by optical emission spectroscopy (Grimes and Marranzino, 1968).

CORRELATION OF MAP UNITS

Qal } QUATERNARY

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Grimes, D. J., and Marranzino, A. P., 1968, Direct-current and alternating-current spark emission spectrographic field methods for the semi-quantitative analysis of geologic materials: U.S. Geological Survey Circular 591, 6 p.

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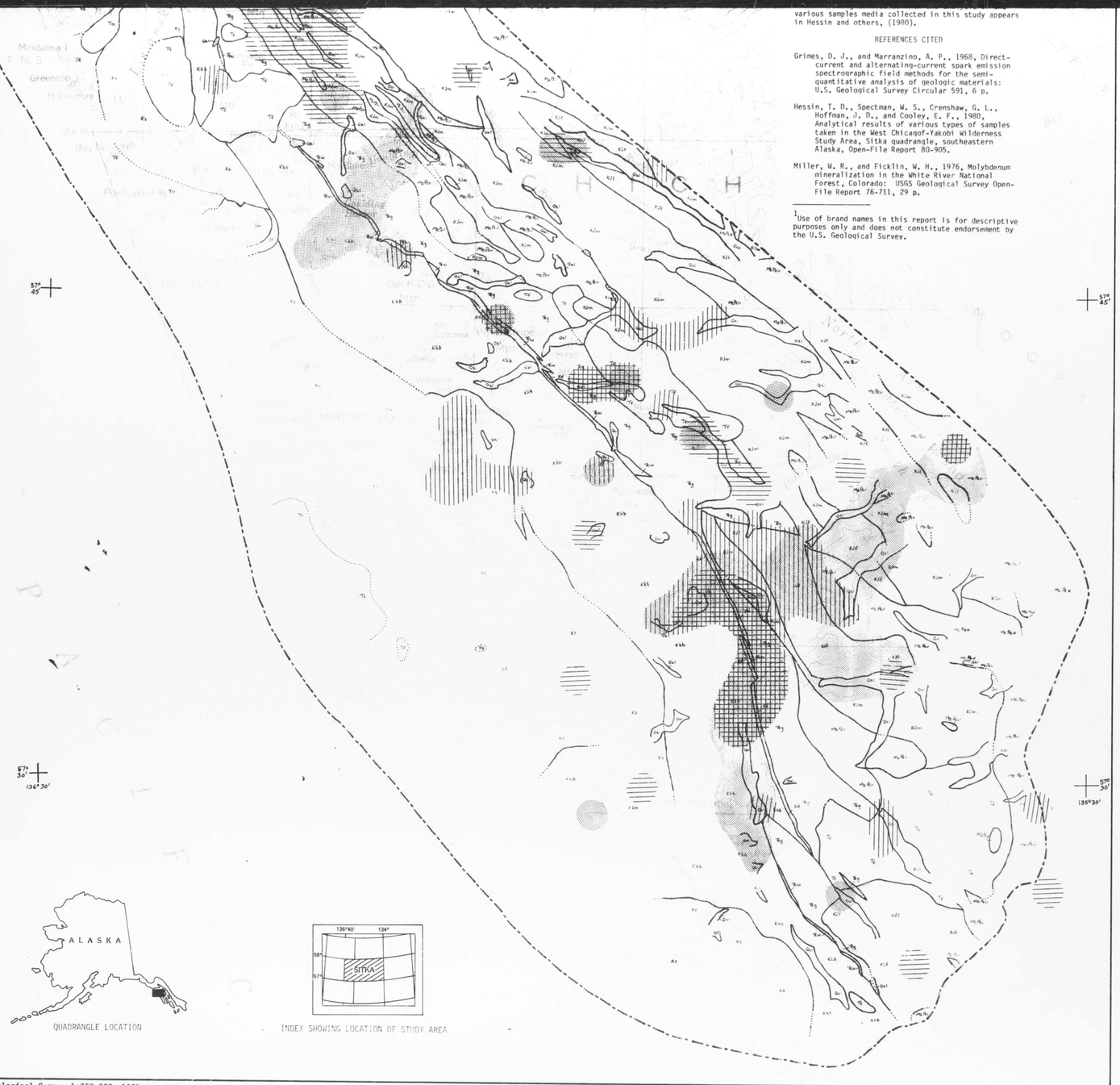
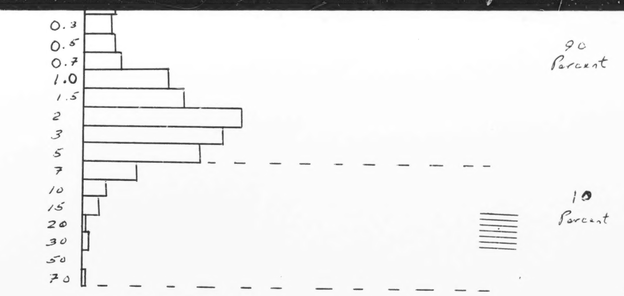


Base from U. S. Geological Survey 1:250,000, 1951
Sitka; Mt. Fairweather

SCALE 1:125 000
8 MILES
8 KILOMETERS



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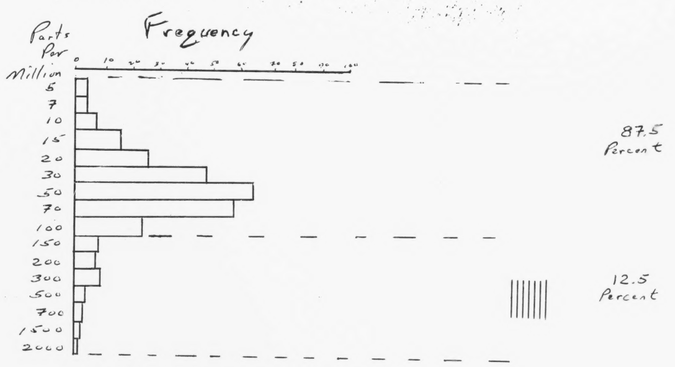

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CORRELATION OF MAP UNITS

Qal	QUATERNARY
Tf, Tm	TERTIARY(?)
Kd	CRETACEOUS(?)
Ks	CRETACEOUS
Kkb	CRETACEOUS
KJf, KJm	CRETACEOUS AND JURASSIC
Trw	TRIASSIC(?)
Trg	TRIASSIC(?)
MzPzu	MESOZOIC AND PALEOZOIC(?)

LIST OF MAP UNITS

Qal	ALLUVIAL DEPOSITS--Undivided
Tf	FELSIC PLUTONIC ROCKS--Dominantly tonalitic
Tm	MAFIC PLUTONIC ROCKS--Dominantly gabbroic
Kd	DIORITE SILL--Extensively altered
Ks	SITKA GRAYWACKE
Kkb	KELP BAY GROUP--Metasediments and metavolcanics
KJf	FELSIC PLUTONIC ROCKS--Dominantly granodiorite
KJm	MAFIC PLUTONIC ROCKS--Dominantly quartz diorite, diorite, and gabbro
Trw	WHITESTRIPE MARBLE
Trg	GOON DIP GREENSTONE
MzPzu	UNDIVIDED METASEDIMENTARY--Metavolcanic and metaplutonic rocks

Studies Related to Wilderness

The Wilderness Act (Public Law 88-577, Sept. 3, 1964) and related Acts require the U.S. Geological Survey to survey certain areas on Federal lands to determine their mineral resource potential. Results must be made available to the public and be submitted to the President and the Congress. This report presents the results of a geochemical survey of the West Chicagof-Yakobi Wilderness Study Area, Sitka quadrangle, southeastern Alaska.

GEOCHEMICAL MAP SHOWING ANOMALOUS PATTERNS FOR THE ELEMENT COPPER IN STREAM SEDIMENTS, FILTERED WATER, AND NONMAGNETIC HEAVY—MINERAL CONCENTRATES IN THE WEST CHICHAGOF—YAKOBI WILDERNESS STUDY AREA, SITKA QUADRANGLE, SOUTHEASTERN ALASKA

By

T.D. Hessin, W.K. Everman, and G.L. Crenshaw

1981